

# Standards based Approach to Video Archive Search and Analysis



**TRECVID – Interactive Surveillance Event  
Detection Task 2012**



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**Who are we?**

**What did we do?**

**What did we learn?**

**What do we plan to do next?**

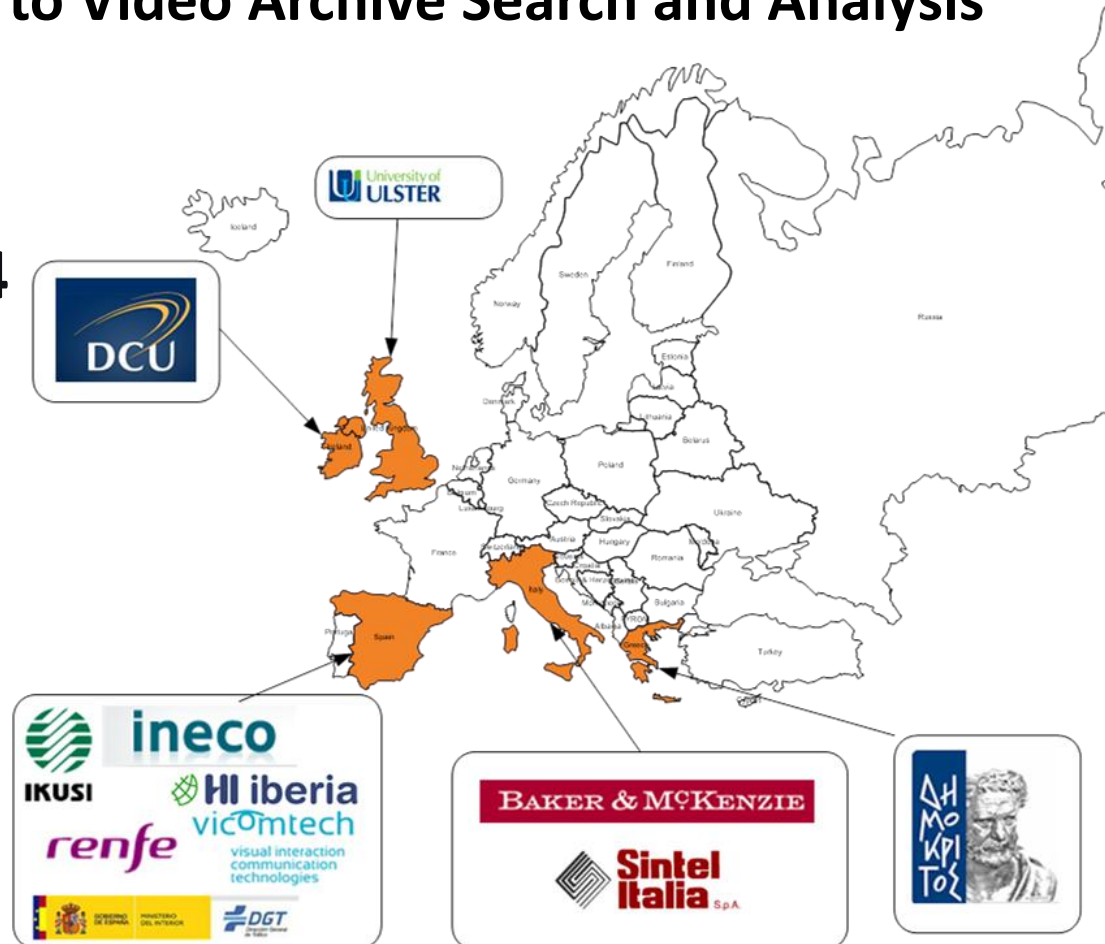


## Standards-based Approach to Video Archive Search and Analysis

**EU FP7 STREP**

**Dec 2011 – May 2014**

**12 partners**





## **CLARITY, DCU, Ireland**

- **Person/object detection**
- **Event recognition**

## **University of Ulster, UK**

- **High-level semantic annotation**
- **Person detection, gesture recognition**

## **Vicomtech, Spain**

- **Person detection and tracking**





**Discussions started in June, f2f meeting at end of July**



**Get real users to perform interactive search!**

**- Vicomtech, IKUSI, RENFE, Hi-Iberia**

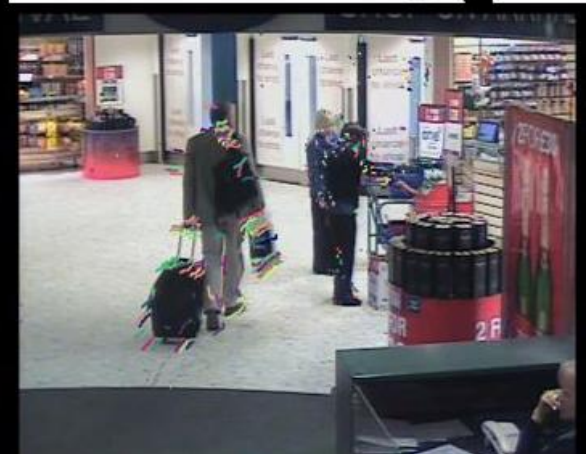
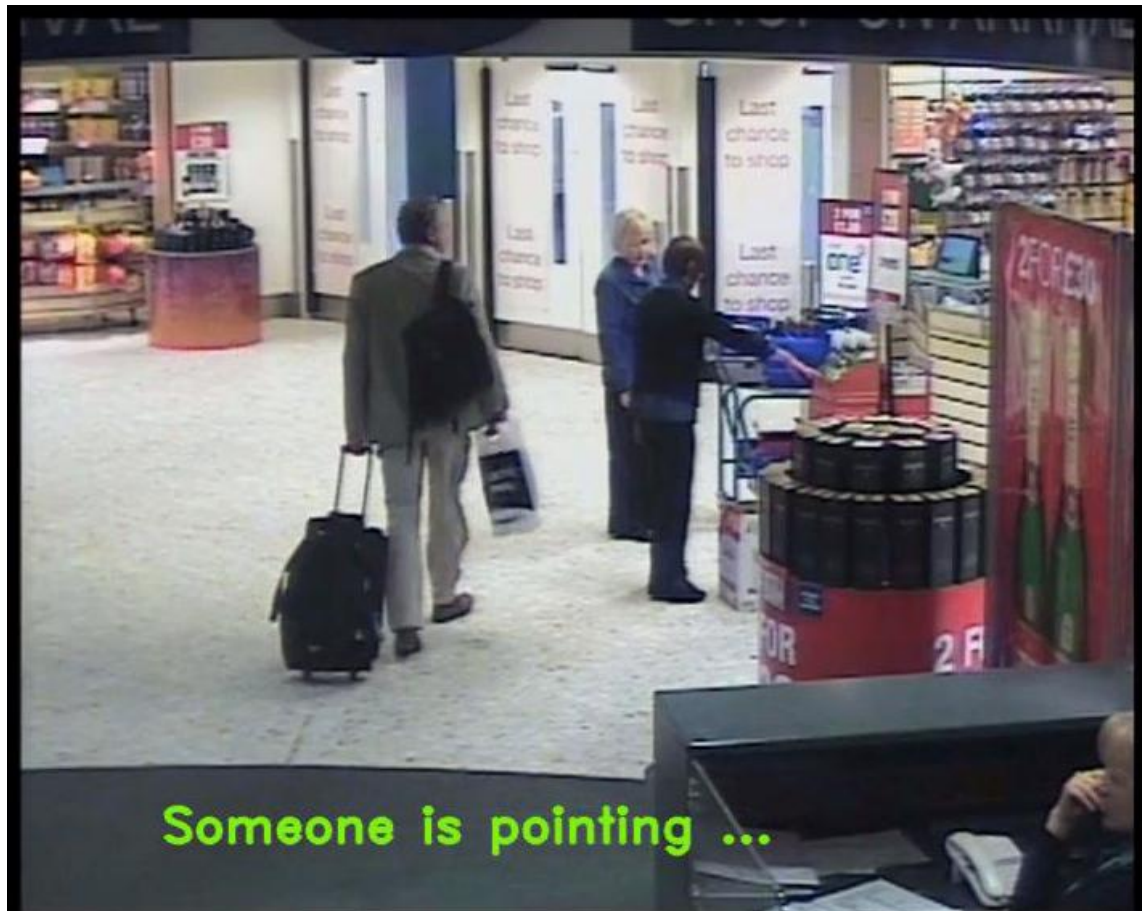
**Three events: ObjectPut, PersonRuns, Pointing**

**Two cameras: CAM1 and CAM3**

**Submitted 2 interactive and  
6 retrospective runs**



# What did we do?



Harris Corner points → KLT → Sparse Trajectories → 15 frame window → HOG+HOF+MBH+TD → K-means clustering → SVM (RBF kernel)



# What did we do?

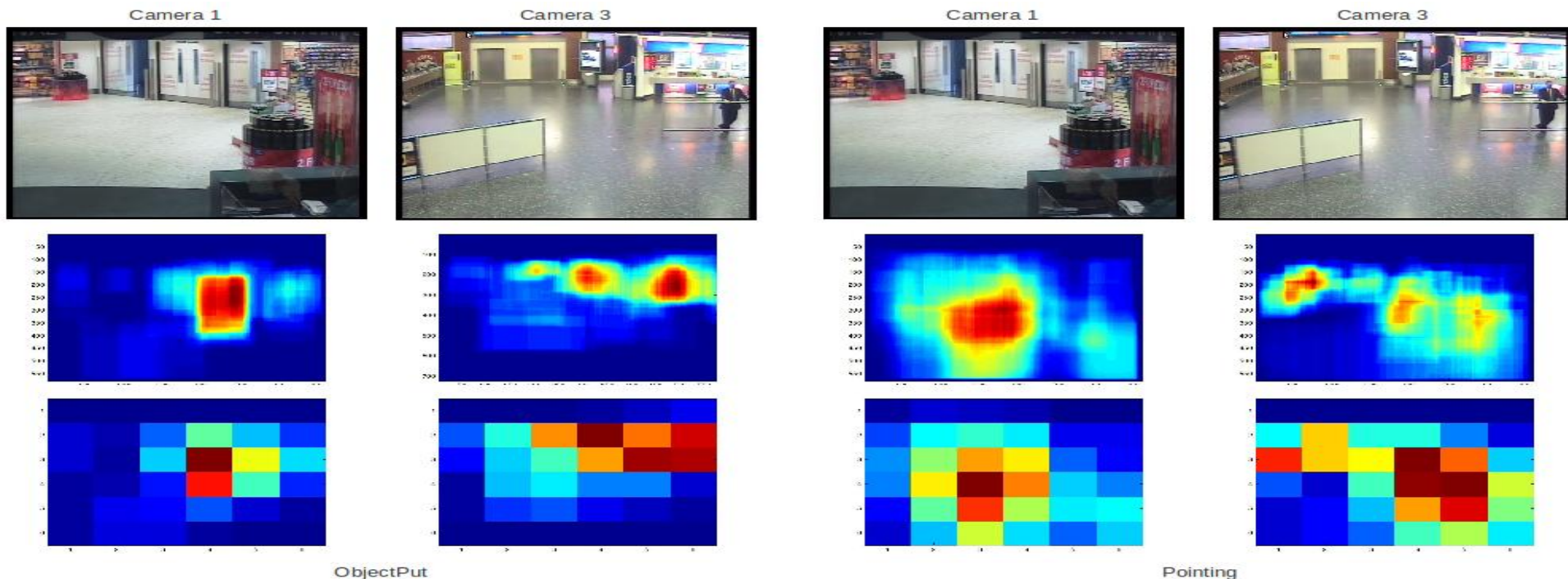




**Optical Flow+HMM | Dense SIFT+SVM**

**Collaborative annotation of region of interest**

**Used post-processing to adjust confidence ranking**







## SEARCH ARCHIVE

### ▲ Event: Alguien apunta

- Demo System
- System A
- System B
- System C

### ▲ Filter Results

- Camera 1
- Camera 2
- Camera 3
- Camera 5

Detection Score > 0.50



CLEAR

FIND ►►

### ▲ Saved Videos (3)



## RETRIEVED RESULTS (1103)





## **‘end users’ and ‘experts’**

1. Introduction to TRECVID and SAVASA project aims
2. Demonstration of interface using the EVAL08 portion of the training dataset (results all ‘correct’).
3. User ‘trains’ on the interface using the EVAL08 dataset.
4. User is instructed to ‘be generous’ and save any segment that they think might be showing the event. User told that time is a ‘limit’ not an instruction to spend the full amount if they feel they are finished.
5. User searches for ‘PersonRuns’, ‘Pointing’, ‘ObjectPut’ events.
6. Results lists merged by a simple vote and detection scores normalised.



## What did we expect?

False alarms would be close to 0

‘experts’ would do better than ‘end users’

...

	‘expert’	‘end user’	all
ObjectPut	1109	238	673
PersonRuns	187	95	141
Pointing	1020	184	602

*Mean search duration in seconds*

# What happened?



run, event	#Targ	#Sys	#CorDet	RFA	PMiss	DCR	minDCR
end users, ObjectPut	621	48	3	2.95136	0.995	1.0099	1.0003
experts, ObjectPut	621	64	3	4.00073	0.994	1.0152	1.0003
end users, PersonRuns	107	10	2	0.52469	0.981	0.9839	0.9836
experts, PersonRuns	107	14	2	0.78703	0.981	0.9852	0.9843
end users, Pointing	1063	25	12	0.85261	0.989	0.9930	0.9926
experts, Pointing	1063	100	25	4.91893	0.976	1.0011	0.9995

‘End users’ were (slightly) better than ‘experts’?

Very high numbers of false alarms





**How our different video analysis tools work**

**Processing time – ~~how to manage TRECvid volume~~**

**About our end users**

“But I’m not interested in when a person points”

“How can I tell if that person is putting their cup down?!”

“Can you make the drop area larger?”





**SAVASA project runs until May 2014**

**Hoping to get real data from our end user partners**

**Technical ideas:**

**exploiting region of interest statistics**

**integrating a spatial relation into the descriptors**

**how to be more efficient using SAVASA's cloud**

**fusion of methods – early vs. late**



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